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(71) Applicant and
(72) Inventor: **WILLIAMS, Christopher, Iain** [GB/GB]; 6 Whims Lane, Wheelton, Chorley, Lancashire PR6 8HN (GB).

(74) Agents: **HOUGHTON, David** et al.; Hulse & Co., St. James House, 8th Floor, Vicar Lane, Sheffield S1 2EX (GB).

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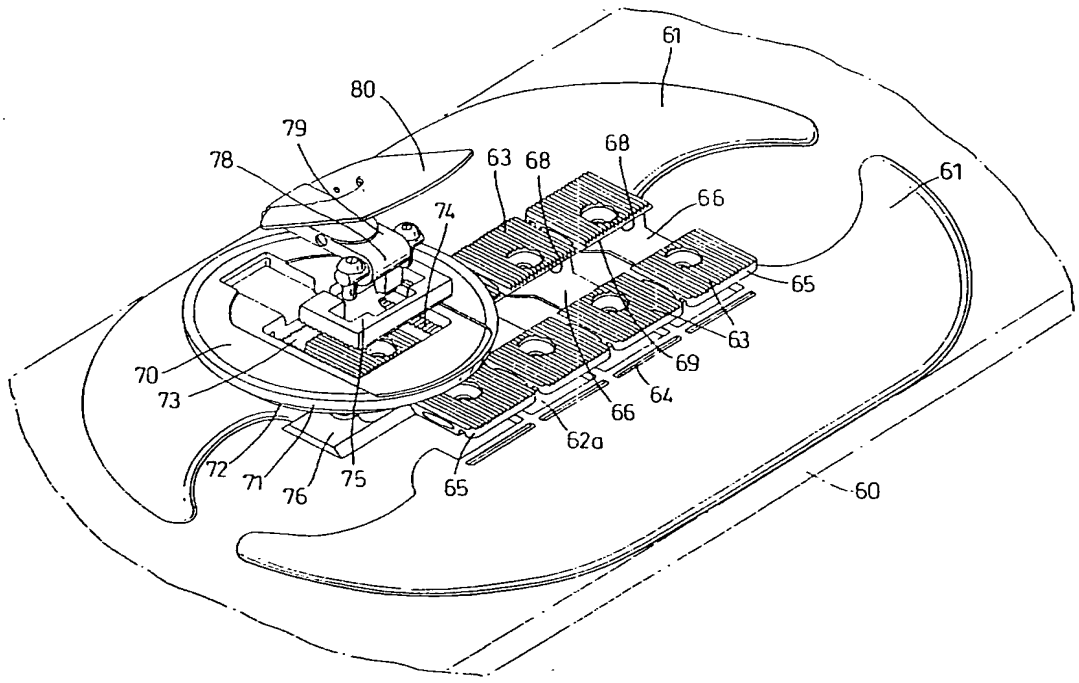
(54) Title: SNOWBOARD BINDING ATTACHMENT SYSTEM




(57) Abstract: The invention relates to a device for attaching a snowboard to a snowboard boot holder commonly known as a binding, that allows tool-free independent longitudinal, lateral and rotational movement. The attachment system is comprised of a track, lock/release mechanism and a base-plate to which the chassis of the binding is attached.

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## DESCRIPTION

### Snowboard Binding Attachment System

This invention relates to a snowboard binding attachment system for attaching a snowboard to a snowboard boot holder commonly known as a "binding". The attachment allows for independent rotational movement of the boot relative to the snowboard as desired.

### Background

Such systems which include binding base-plates are well known and commercially available, but suffer several functional disadvantages. The purpose of the base-plate is to allow the binding to be secured to the snowboard. It allows rotational and some longitudinal and lateral adjustability. Some base-plates only allow rotational and longitudinal or lateral adjustability, not both. This can severely hamper the rider's personal stance requirements.

All base-plates work in the same way: such a base-plate consists of a disc with teeth around its peripheral edge adapted for location in a corresponding circular aperture in the binding chassis having corresponding teeth around its peripheral edge. The teeth of the base-plate may be brought into register with selected teeth of the binding chassis to locate the plate in any rotational position relative to the chassis at will. This allows for rotational adjustability.

The base-plate is fastened to the snowboard via screws passing through holes in the base-plate and received by screw-threaded apertures in the snowboard. Three or four screws are provided depending upon the type of

commercially available snowboard. On the other hand, there are more holes in the base-plate than apertures in the snowboard and the apertures in the snowboard may be brought into alignment with selected holes in the snowboard. This allows for a selection of base-plate holes which are to be brought into register with the apertures in the snowboard, thus allowing for some variable stance modification. When screwed down the base-plate clamps the binding chassis to the upper surface of the snowboard.

Once screwed down it is not possible to move the binding chassis laterally or longitudinally without fully removing all of the screws with the aid of a tool. In some cases it is possible to modify the rotational position of the binding chassis by slackening off the screws and rotating the chassis to the desired position then retightening them. Some binding chassis are fitted with catches that allow tool-free rotational adjustability but nothing more. It is impossible to modify the stance other that rotationally without the use of tools.

It is common for riders to change the stance set up of their bindings during the day, particularly longitudinally. This can be a very frustrating task as it is common for the screws securing the base-plate to become packed with ice. The ice has to be chipped away to reveal the screw heads allowing them to be un-screwed, the binding repositioned and then screwed back down. This operation will probably need to be repeated with respect to the binding for the other foot. It is very difficult to perform such tasks with gloves on thus requiring bare hands to be used in what could be very cold conditions. As riders encounter different snow conditions on the mountain they could need to change their stance several times per day.

**Solution**

This invention addresses the problem of providing a device for incorporation into a snowboard binding attachment system that allows tool-free, independent longitudinal, lateral and rotational adjustability. It allows for fast binding adjustment so that riders can modify their stance to suit the changing snow conditions without the inconvenience of the conventional base-plate system. This attachment system desirably also works in conjunction with widely available snowboard fastening arrangements and manufacturer's standard binding chassis.

Thus according to the invention there is provided a device for attachment of a snowboard to boot holder adapted to receive a boot of a wearer,

which boot holder includes an apertured chassis having around the circumferential edge of the aperture a plurality of teeth, and a base-plate adapted to sit within the aperture, and having around the circumferential edge thereof a plurality of teeth co-operable with the teeth around the circumferential edge of the aperture to allow location of the base-plate at a selected position of rotation relative to the chassis,

which snowboard has a plurality of spaced apart first fastening elements co-operable with means for attachment of the device to the snowboard and which device comprises,

a plurality of anchor blocks each arranged in one of a pair of parallel spaced apart rows and each block being provided with a second fastening element, each of the first and second fastening elements being co-operable with one another to secure the anchor blocks to the snowboard,

each of which anchor blocks in a row thereof having a respective profiled edge in alignment with the profiled edge of the or each other anchor block in the row thereof and the profiled edges of the blocks in the respective rows being in face to face relationship with one another so as to define a track between the respective rows,

each of which anchor blocks in a row thereof being interconnected with the next by at least one resilient connecting element to allow for displacement of the anchor blocks relative to one another on bending of the snowboard out of the horizontal plane thereof, and

securable beneath the base-plate of the boot holder, a sliding plate having respective profiled opposed longitudinal edges capable of cooperation with the respective profiled edges of the anchor blocks in each respective spaced apart row thereof so as to allow the sliding plate to slide along the track defined by the respective rows, whereby the base-plate to which the sliding plate is securable is capable of assuming a selected longitudinal position relative to the snowboard and

a locking member capable of locking the sliding plate in the selected position, the entire base-plate being thereby securable in a predetermined longitudinal position relative to the snowboard.

Thus traditional mounting systems are restrictive because the binding is *directly* mounted onto the board through the base-plate. The functionality of the new system is due to the binding being secured via a remote assembly. The binding is not directly attached to the board; instead a simple track is screwed to the board, allowing a lock/release mechanism to anchor the base-plate in position. The anchor

mechanism may be compact, and may sit entirely inside the base-plate. The base-plate offers normal binding chassis rotational adjustment. In addition however, it offers greater, and finer, heel/toe adjustment, while the track allows for independent longitudinal adjustment.

The whole system is an assembly made up of three small sub-assemblies: the track, the lock/release mechanism and the base-plate. In addition to this, each binding may be fitted with two raisers to lift the binding chassis clear of the track.

Preferably the locking member, on activation thereof is capable of displacing one of the snowboard and base-plate towards the other.

A particularly preferred lock assembly is a cam lock, but it would be possible to utilise other locking mechanisms such as over centre locks and slide catches.

Thus in a preferred device the locking member is a cam located in a cam housing disposed above the sliding plate and actuable by a rotatable cam handle pivotable about a rod disposed above the cam housing and secured to the sliding plate by fastening means, the cam being capable of assuming a first, release position, in which a cam surface is spaced apart from a base of the cam housing and can activation of the cam handle, a second, locking position at which the cam surface is brought into pressing engagement with the base of the housing the cam thereby serving to compress upwardly the sliding plate towards the cam housing, the profiled edges of the sliding plate being thereby brought into frictional engagement with the corresponding profiled edges of the anchor blocks.

More preferably the device additionally comprises:

1) a locater adapted to be secured to an underface of a base-plate, which locater comprises a plate having therein a plurality of apertures; and

2) a plurality of upstanding pegs offset from rear edges of anchor blocks in one of the rows thereof and at least a number of the pegs being spaced apart from one another along the track, which apertures in the locater are capable of being brought into register with corresponding pegs on sliding of the sliding plate along the track, and

whereby on actuation of the locking member to displace one of the snowboard and base-plate towards the other respective pegs are received in respective apertures in the locater to further secure the base-plate in position relative to the snowboard.

Thus in such an embodiment a plurality of upstanding pegs is offset from rear edges of anchor blocks on one of the rows thereof. The pegs are arranged longitudinally, parallel to the track and a plate having corresponding apertures capable of registering with the pegs is secured to the base-plate such that on attachment of the lock mechanism the pegs are received by the apertures to still further secure the binding in the locked position. If desired further pegs disposed laterally to the longitudinally arranged pegs may be provided to spread the locking area. It is also preferred to provide many more pegs than apertures in the locator: this allows the user to select a particular longitudinal position of the base-plate along the track.

Preferably the attachment system is to be made of a plastic material or metal or from a combination of these materials.

Two embodiments of the invention will now be described with reference to the accompanying drawings in which:

FIGURE 1 shows an isometric view of one track assembly in a device embodying the invention;

FIGURE 2 shows an exploded view of a lock/release assembly of such a device;

FIGURE 3 shows an exploded view of a base-plate assembly of such a device;

FIGURE 4 shows an exploded view of the whole assembly;

FIGURE 5 is an exploded isomeric view of a second embodiment of the invention;

FIGURE 6 corresponds to FIGURE 5 but shows parts removed for clarity;

FIGURE 7 is an isomeric view from below of the embodiment of FIGURE 5; and

FIGURE 8 is an exploded front elevation of the second embodiment of the invention.

Referring first to Figure 1, this shows a track assembly, generally indicated as 20 for attachment to a snowboard. The track assembly consists of two strips each of respective anchor blocks 1,2 defining opposing sides of the track. In practise, two such track assemblies 20, spaced apart longitudinally from one another along the snowboard are provided one for each binding. Both sides of the track assembly are constructed from respective anchor blocks 1,2 connected to one another via a restraining member 3. Each anchor block 1,2 is individually mounted via a screw 4 to a corresponding standard mount on the upper surface of the snowboard. An inwardly facing longitudinal edge of each anchor block 1,2 is profiled so as to provide a generally V–sectioned projection 22 having a downwardly inclined upper face 24 and an upwardly inclined lower face 26. The

upper surface of the snowboard 30, in conjunction with the sliding plate 5, effectively form an element of a dovetail connection. Since each anchor block 1,2 has the same profile, it is possible for the sliding plate 5 to move underneath the full length of the track so defined. It is possible to remove the sliding plate 5 only from each end of the track and not from any intermediate position.

One strip of anchor blocks 1 is equipped with a row of mounting pegs 36 along the longitudinal outer edge of the track. These are used in conjunction with a base-plate locator 6. The locater 6 has holes 38 in it corresponding to the pegs 36 thus allowing it to be positioned over the pegs 36. Although shown for clarity as unconnected in Figure 1, the locator 6 is in practice fastened with several screws 15 to an underside of a base-plate 14, as shown in Figure 3. When the base-plate locater 6 is positioned over the pegs 36 it cannot move in any direction other than vertically. This allows the base-plate 14 to be remotely secured in a desired position, by the pegs 36 passing through the locater 6. There is a greater number of pegs 36 than holes 38 so that the user may select at will the holes to be brought into register with particular groups of pegs thus allowing longitudinal adjustment.

As shown in Figure 2, the lock/release mechanism links the base-plate 14 to the track. It is a simple device that allows fast tool-free base-plate 14 repositioning. The mechanism is operated by a simple cam lock 50. The cam lock 50 sits in a housing 40 (see especially Figure 4) in an upper clamp 11. A horizontal rod 8 passes through a hole 9 in a cam lock handle 52 around which the cam handle 52 pivots. The rod 8 protrudes from both ends of the cam lock leaving enough clearance for respective vertical holes 54 externally of the cam lock handle 52 and

adapted to receive respective fasteners 7 the free ends of which are secured in respective apertures 56 in the sliding plate 6.

For activation of the cam lock, the cam lock arm 52 is depressed by anticlockwise rotation around the rod 8. When locked the cam lock 9 presses the upper clamp 11 and the sliding plate 5 together. As the sliding plate 5 and upper clamp 11 are pressed toward one another by the cam lock 9, so respective profiled edges 32 of the sliding plate 5 are brought into face to face frictional engagement with the respective lower faces 26 of the projections 22 of the anchor blocks 1,2. This compression in turn presses the base-plate 14 into the chassis of the binding. As the base-plate 14 is pressed down, the pegs on the edge of the anchor blocks 1 locate with the base-plate locator 6. The whole assembly is locked in position.

To release the mechanism the cam lock arm 52 is rotated clockwise around rod 8. This creates a gap between the cam lock 9 and the upper clamp 11. The upper clamp 11 can now be lifted to take up the free space. This releases the base-plate 14 in turn releasing the binding chassis. As the base-plate 14 is lifted the base- plate locator 6 disengages from the anchor block pegs 36 allowing the whole assembly to slide up or down the track. The assembly may then be repositioned and locked down in a new position by rotating the cam lock 9 back to its original position.

When the cam lock 9 is in the locked position there is a great deal of pressure on it. This can create difficulties when a user wishes to release the lock due to friction between the cam lock 9 and the upper clamp 11. In order to reduce the friction, the cam lock 9 is fitted with a slipper 10 of for example a waxy or

smooth plastic material or a coating allowing easy release. This component helps the assembly operate smoothly. The cam lock handle 52 is also equipped with a ring puller 13. This aids the user when releasing the cam lock 9. The ring pull 13 is secured in place by a pin 12.

As shown in Figure 3, the base-plate 14 performs several key functions: it clamps the binding chassis to the snowboard and enables rotational chassis orientation and lateral adjustment. The base-plate 14 also houses the lock/release mechanism flush with the upper surface of the base-plate.

Essentially the base-plate 14 is a disc with teeth (not shown) around its external periphery, typically in a lower face of the base-plate 14 for co-operation with corresponding teeth in the upper face of a chassis of the binding around the aperture in which the base-plate sits. Alternatively teeth are provided in an axially tapered circumferential edge of the base-plate 14 for co-operation with corresponding teeth in the axially tapered internal circumferential edge of the aperture in the chassis of the binding around the aperture in which the base-plate sits. The teeth engage on one another allowing the binding chassis to be secured relative to the base-plate at any desired angle.

The lateral adjustment of the base-plate 14 is enabled in conjunction with the upper clamp 11 of the lock/release mechanism. The sliding plate 5 with its lock/release mechanism, always runs down the centre of the track The base-plate 14 is equipped with a lateral rectangular toothed cut-out. There are teeth on both sides of the cut-out 42 that correspond with teeth on the upper clamp 44. When the binding chassis is required to be moved forward or backward the upper clamp

11 is relocated in the desired direction within the base-plate. This moves the binding chassis in the desired direction so as to produce the correct heel/toe boot overhang for the rider.

Figure 4 shows the full exploded assembly.

As the sliding plate 5 and upper clamp member 11 are pressed toward one another by the cam lock 9 so the respective parallel edges of the sliding plate 5 are brought into secure face-to-face relation with lower face 26 of the projections 22 of the anchor blocks 1,2. This provides a particular secure locking.

**Using the System**

Fasten the track to the snowboard with the screws 4. Position base-plate locator 6 so that the correct heel/toe boot overhang is achieved. Screw the base-plate locator 6 in position.

Slide the sliding plate 5 into the track and place the base-plate 14 over it. Place the upper clamp 11 in the base-plate 14 cut-out so that it sits above the centre line of the track. Push the rod 8 through the hole in the cam lock 9 and place the components in the upper clamp cup 11. Twist the rod 8 round until the holes 54 in either end of the rod 8. Line up with the corresponding holes 56 in the sliding plate 5. With the cam lock 9 in the locked position, screw in two fasteners 7 equal amounts each side. The assembly is now firmly attached to the snowboard.

To relocate the binding, lift the cam lock ring pull 13 hook a finger through the ring pull 13 and rotate the cam lock 9 clockwise. This releases the upper clamp 11. The base-plate can be lifted and the assembly is free slide to a new position.

Lock the binding in position by pushing the cam lock 9 down back to the locked position flush with the top of the base-plate 14.

The binding may be relocated as many times as necessary without the need for any tools. The binding can also be completely removed from the snowboard by releasing the cam lock 9 and sliding the assembly out of the track.

In the second embodiment of the invention shown in Figures 5 to 7, a snowboard 60 has mounted thereon in a removable manner, two base-plate members 61, the two members having facing inner edges 62, having castellations 62a, to create recess for anchor blocks 63, and co-operating with each recess is an indentation 64 to receive a downwardly facing flange 65 on the anchor blocks. The anchor blocks 63 are formed in pairs connected together by a bridging member 66, and each block of each pair has a fixing screw to secure the blocks to standard mounts located within the snowboard.

With the blocks 63 in place, and screwed to the mounts, the flanges 65 engaging the indentations 64 ensures the secure attachment of the base-plate members 61 to the snowboard. For greater security, and to prevent ice and snow penetrating below the base-plate members at their outer edges, there may be, as is illustrated in Figure 6, a securing means provided on the undersurface of the base-plate members, such as a series of suction cups 67 in spaced relationship inwardly of the outer edges of the base-plate members.

By having the blocks 63 in pairs with a bridging member 66, the spacing between the blocks of a pair can be substantially guaranteed, and with the innermost edges 68 of the blocks profiled to provide a general V-shaped projection

69, the blocks combine to form a guide track, the accuracy of which can be guaranteed.

As is shown particularly by Figure 5, the upper surfaces of all of the anchor blocks 63 are serrated, the serrations of one block being in precise alignment with the second block of each pair. Here, a base-plate 70, with an outer flange 71 to engage an inner flange in an aperture of a chassis of the binding (not shown), the flanges in conventional manner having co-operating serrations to allow the chassis to be positioned on the base-plate in a desired orientation, has a bottom surface 72 formed with transverse serrations to match the serrations in the surfaces of the anchor blocks 63, and such that the base-plate 70 and, hence, the chassis of the binding can be located at any point along the length of the track formed by the anchor blocks, and securely held in a required position by the engagement of the serrations on the bottom face of the base-plate 70 engaging the serrations across the surfaces of the pairs of anchor blocks 63.

Generally, centrally of the base-plate is a rectangular aperture 73 having inwardly facing flanges 74 to opposite sides of the aperture. A clamp plate 75 of a camming locking device is located in the aperture, with the under surface of the clamp plate having serrations to engage those of the flanges 74, and below the base-plate is a slider 76 the edges 77 of which are shaped to be a close sliding fit in the track formed by the anchor blocks 63. Attached to the slider is the spindle of a camming device, off-centre through a spindle mount 78 on which is a cam lock arm 79. Here, a pull ring 80 to allow the arm 79 to be raised has an area and shape to allow it to rest against the surface of the clamp plate and effectively seal the

aperture against the ingress of ice and snow. From a released position, rotation of the cam lock arm and hence rotation of the spindle mount, has the effect of urging the spindle and hence the slider 76 towards the underside of the clamp plate.

Thus, with the cam lock released, and with the base-plate fitted to a chassis, at any required orientation, the slider 76 can be introduced into the track formed between the anchor blocks 63 and the base-plate 70 and chassis slid to a desired position along the track, at which point the cam lock arm is swung to the closed position, the upward force applied to the slider acting on the track, to create a clamping force between the base-plate and the upper surface of the anchor blocks, and the engagement of the serrations on the underside of the anchor plate and providing a substantial resistance to any longitudinal movement of the chassis and, hence, a boot located in the chassis along the snowboard when in use. The serrated connection between the clamping plate and the flange in the aperture in the clamping plate is such that when the cam lock is activated, there is provided a substantial resistance to any tendency for the chassis and hence the boot of the user from moving transversely of the snowboard when in use.

In the construction of Figures 5 to 8, the two base-plate members 61 are formed of a durable, but relatively resilient, plastics material, able to flex as and when the snowboard flexes in use. Here, and in replacement of the connecting rods 3 between longitudinally adjacent anchor blocks, the material of the base-plate members between the blocks and to which the blocks are secured, serves the same restraining purpose, allowing the blocks to move with the snowboard as it flexes, without disturbing the integrity of the track formed by the anchor blocks.

With the construction of Figures 5 to 8, the anchor blocks 63 locate against the surface of the snowboard as do the anchor blocks 1, 2 of Figure 1, but here, they lie flush with the upper surfaces of the base-plate members 61. This allows an unrestricted 360° movement of the chassis of the binding about the base-plate.

To facilitate the engagement of the clamp plate slider 76 in the track formed by the anchor blocks 63, the base-plate members 61 each have a depression of a depth in comparison with the depth of the blocks, such that with the blocks and the base-plate members attached to the surface of the snowboard, the track is exposed for access by the slider 76 and the surface of the anchor blocks are substantially co-planar with the surface of the remainder of base-plate members, thereby facilitating unrestricted rotation of the chassis about the base-plate.

## CLAIMS

1. A device for attachment of a snowboard to boot holder adapted to receive a boot of a wearer,

which boot holder includes an apertured chassis having around the circumferential edge of the aperture a plurality of teeth, and a base-plate adapted to sit within the aperture, and having around the circumferential edge thereof a plurality of teeth co-operable with the teeth around the circumferential edge of the aperture to allow location of the base-plate at a selected position of rotation relative to the chassis,

which snowboard has a plurality of spaced apart first fastening elements co-operable with means for attachment of the device to the snowboard and which device comprises,

a plurality of anchor blocks each arranged in one of a pair of parallel spaced apart rows and each block being provided with a second fastening element, each of the first and second fastening elements being co-operable with one another to secure the anchor blocks to the snowboard,

each of which anchor blocks in a row thereof having a respective profiled edge in alignment with the profiled edge of the other anchor block in the row thereof and the profiled edges of the blocks in the respective rows being in face to face relationship with one another so as to define a track between the respective rows,

each of which anchor blocks in a row thereof being interconnected with the next by a means to allow for displacement of the anchor blocks relative to one another on bending of the snowboard out of the horizontal plane thereof, and

securable beneath the base-plate of the boot holder, a sliding plate having respective profiled opposed longitudinal edges capable of cooperation with the respective profiled edges of the anchor blocks in each respective spaced apart row thereof so as to allow the sliding plate to slide along the track defined by the respective rows, whereby the base-plate to which the sliding plate is securable is capable of assuming a selected longitudinal position relative to the snowboard and

a locking member capable of locking the sliding plate in the selected position, the entire base-plate being thereby securable in a predetermined longitudinal position relative to the snowboard.

2. A device according to Claim 1, wherein the locking member on actuation thereof is capable of displacing one of the snowboard and base-plate towards the other.

3. A device according to Claim 2, wherein the locking member is a cam located in a cam housing disposed above the sliding plate and actuable by a rotatable cam handle pivotable about a rod disposed above the cam housing and secured to the sliding plate by fastening means, the cam being capable of assuming a first, release position, in which a cam surface is spaced apart from a base of the cam housing and on activation of the cam handle, a second, locking position at which the cam surface is brought into pressing engagement with the base of the housing, the cam thereby serving to compress upwardly the sliding plate towards the cam housing,

the profiled edges of the sliding plate being thereby brought into frictional engagement with the corresponding profiled edges of the anchor blocks.

4. A device according to Claims 2 and 3, which additionally comprises a locater to be secured to an under face of a base-plate, which locater comprises a plate having there in a plurality of apertures and a plurality of upstanding pegs offset from rear edges of anchor blocks in one of the rows thereof and at least a number of the pegs being spaced apart from one another along the track, which apertures in the locater are capable of being brought into register with corresponding pegs on sliding of the sliding plate along the track, and whereby on actuation of the locking member to displace one of the snowboard and base-plate towards the other respective pegs are received in respective apertures in the locater to further secure the base-plate in position relative to the snowboard.

5. A device according to any one of Claims 1 to 4, wherein the means to allow for displacement of the anchor blocks is at least one resistant rod interconnecting the anchor blocks.

6. A device according to any one of Claims 1 to 4 wherein the means to allow for displacement of the anchor blocks is a resilient mounting plate attached to the snowboard and to which the anchor blocks are attached.

7. A device as in Claim 6, wherein the mounting plate is formed by two mounting plate members.

8. A device as in Claim 7, wherein the mounting plate members have an inner edge formed with castellations that co-operate to form recess to receive the anchor blocks of respective rows.

9. A device as in Claim 6, wherein a number of indentations are provided in each mounting plate member, to co-operate with a respective recess, and each anchor block having an outmost downwardly extending flange to engage in a respective indentation.

10. A device as in any of Claims 6 to 7, wherein transversely adjacent anchor blocks of the rows of blocks, are interconnected by a bridging member.

11. A device as in any of Claims 6 to 8, wherein the mounting plate has a generally central depression in which are located the anchor blocks, the depth of the depression in comparison with the depth of the anchor blocks being such that the blocks stand proud of the surface of the depression to allow access by the sliding plate, and the surface of the anchor blocks are co-planar with the surface of the mounting plate adjacent to the depression.

12. A device as in Claim 7 and Claim 11 when appended to Claim 7, wherein each plate member has a depression.

13. A device as in any of Claims 6 to 12, wherein the undersurface of the base-plate of the boot holder is transversely serrated, and the upper surfaces of the anchor blocks are correspondingly serrated, such that with the base-plate located on the anchor blocks, longitudinal movement of the base-plate and the chassis of the boot holder is prevented.

14. A device as in Claim 13, wherein the slider to engage the track formed by the anchor blocks is attached to a camming locking device located in an aperture in the base-plate, the camming locking device having a clamping plate located in the

aperture, the undersurface of which is serrated to engage serrated inwardly directed flanges to the side of the aperture.

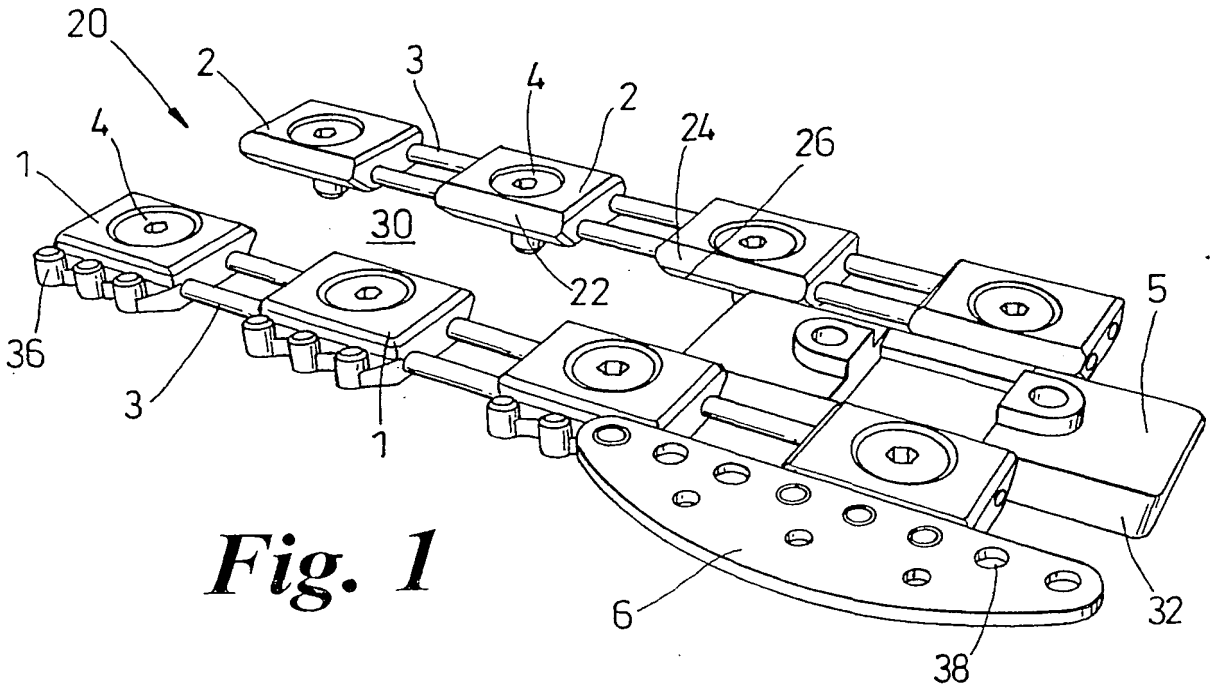


*Fig. 1*

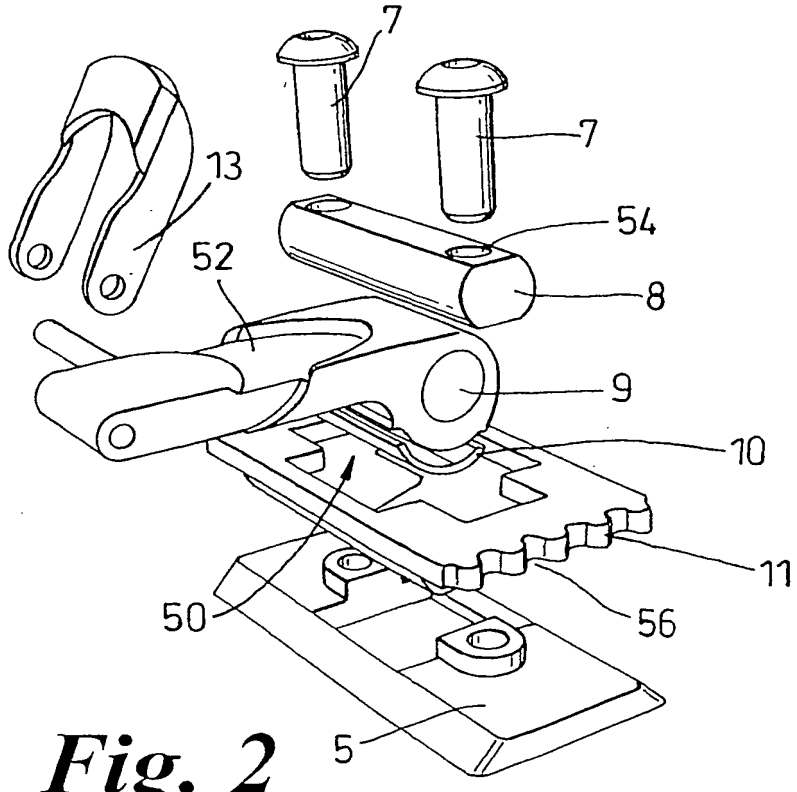


*Fig. 2*

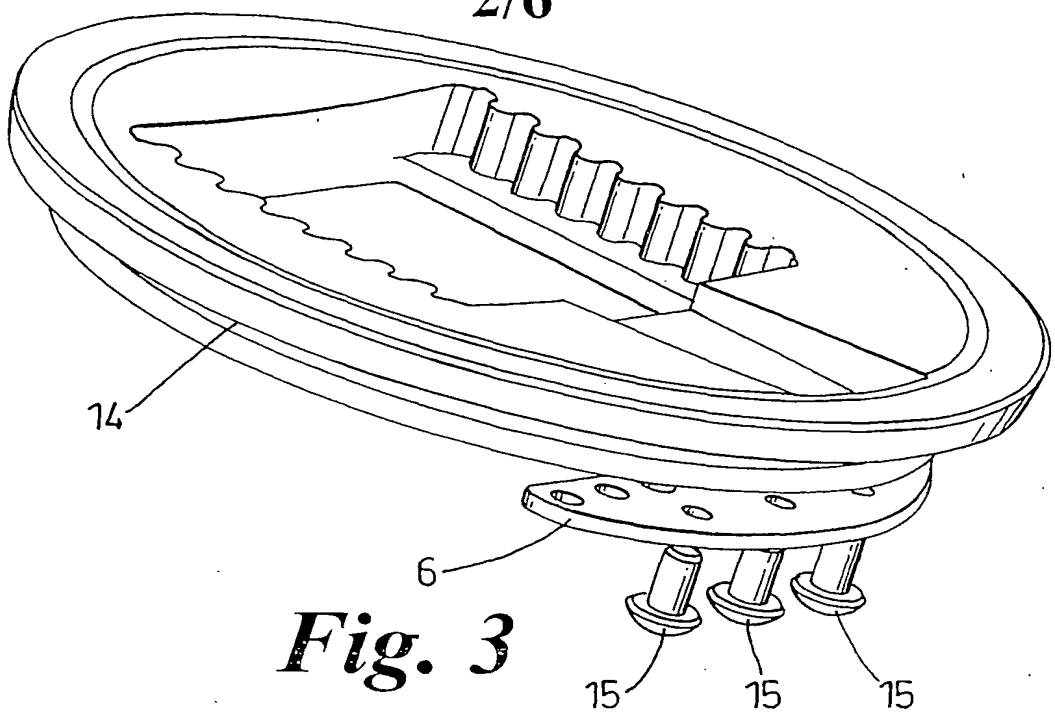


Fig. 3

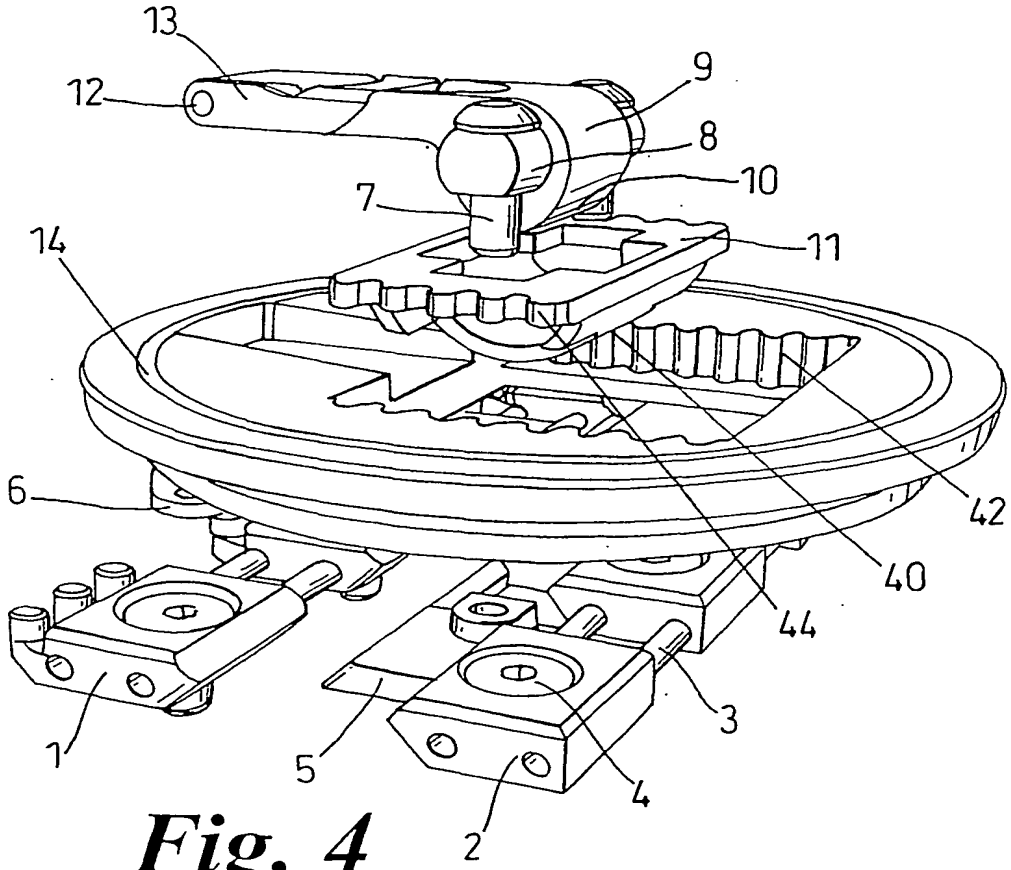


Fig. 4

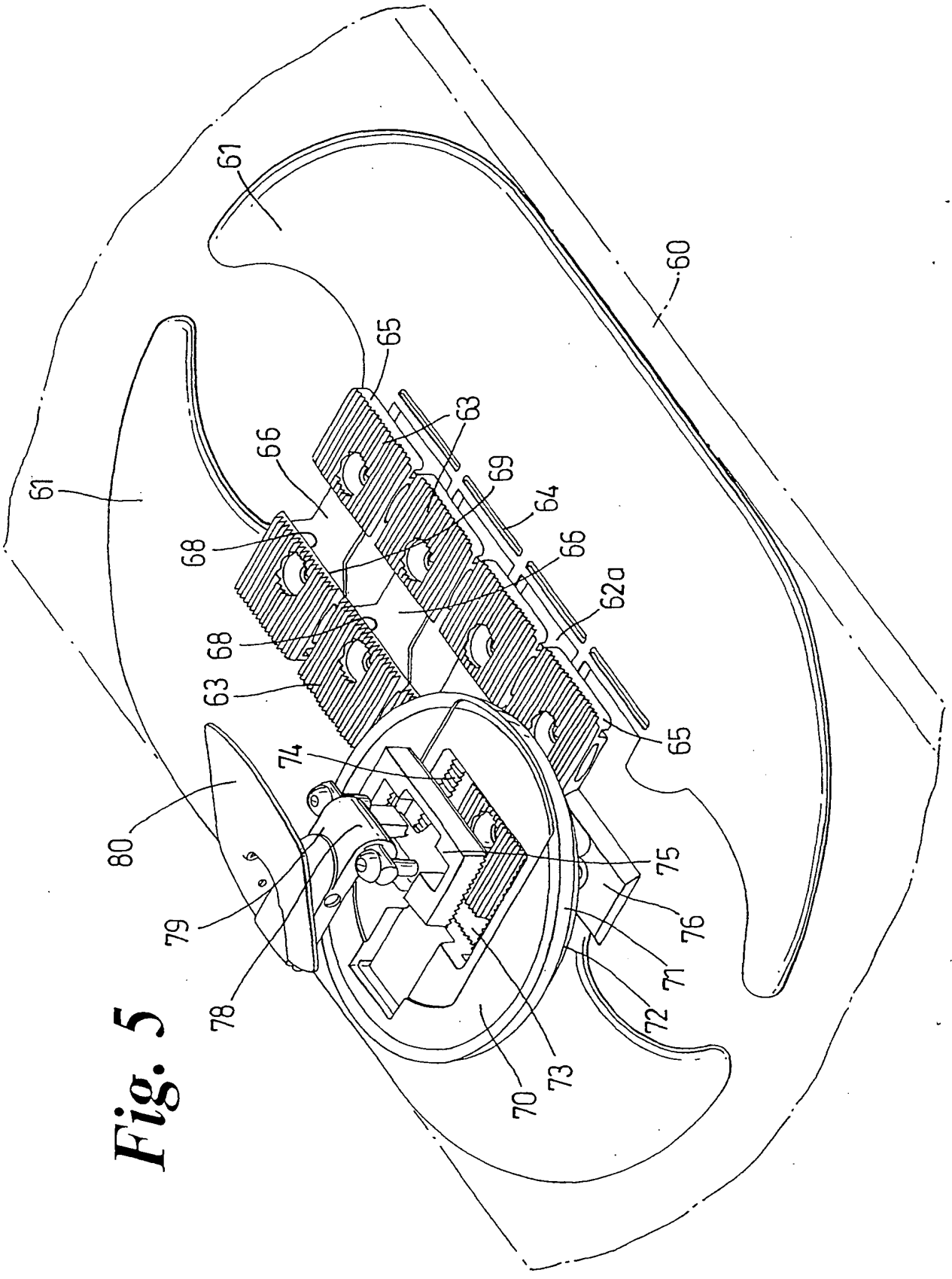


*Fig. 5*

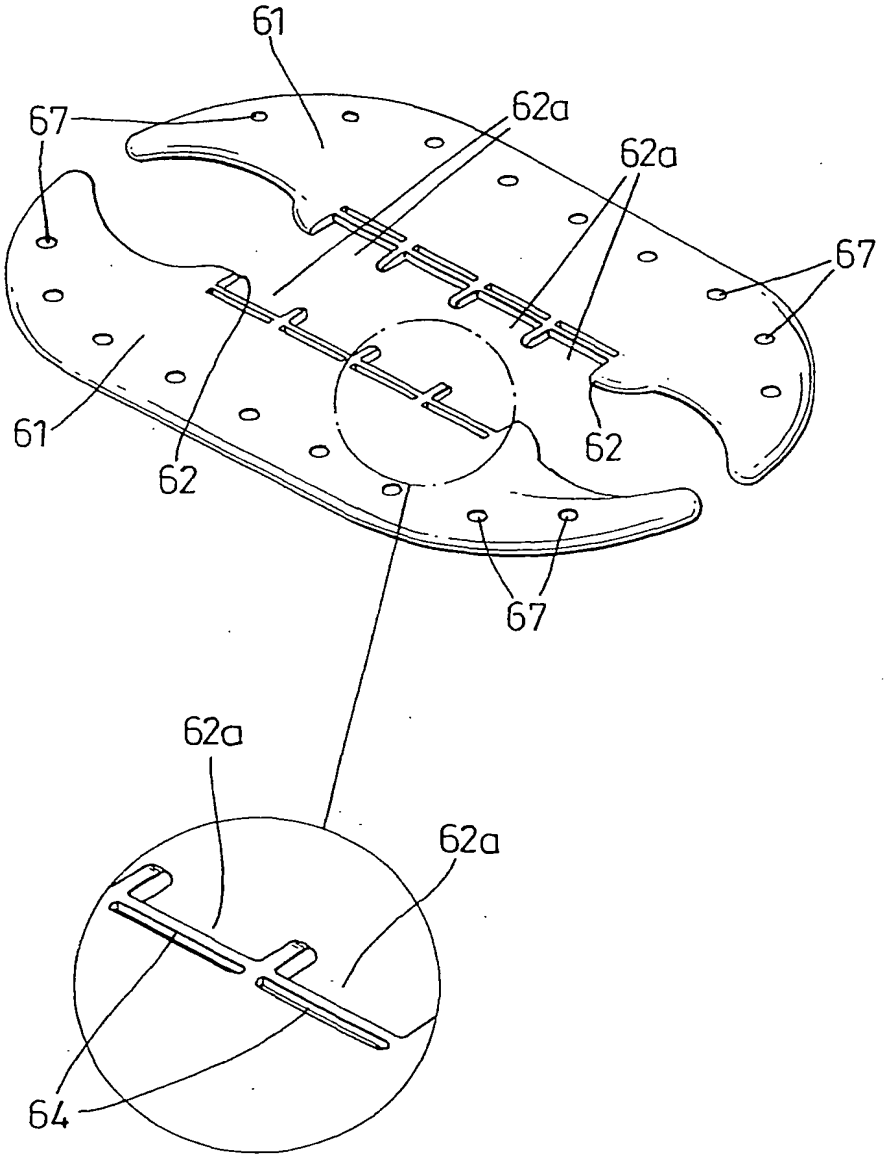


*Fig. 6*

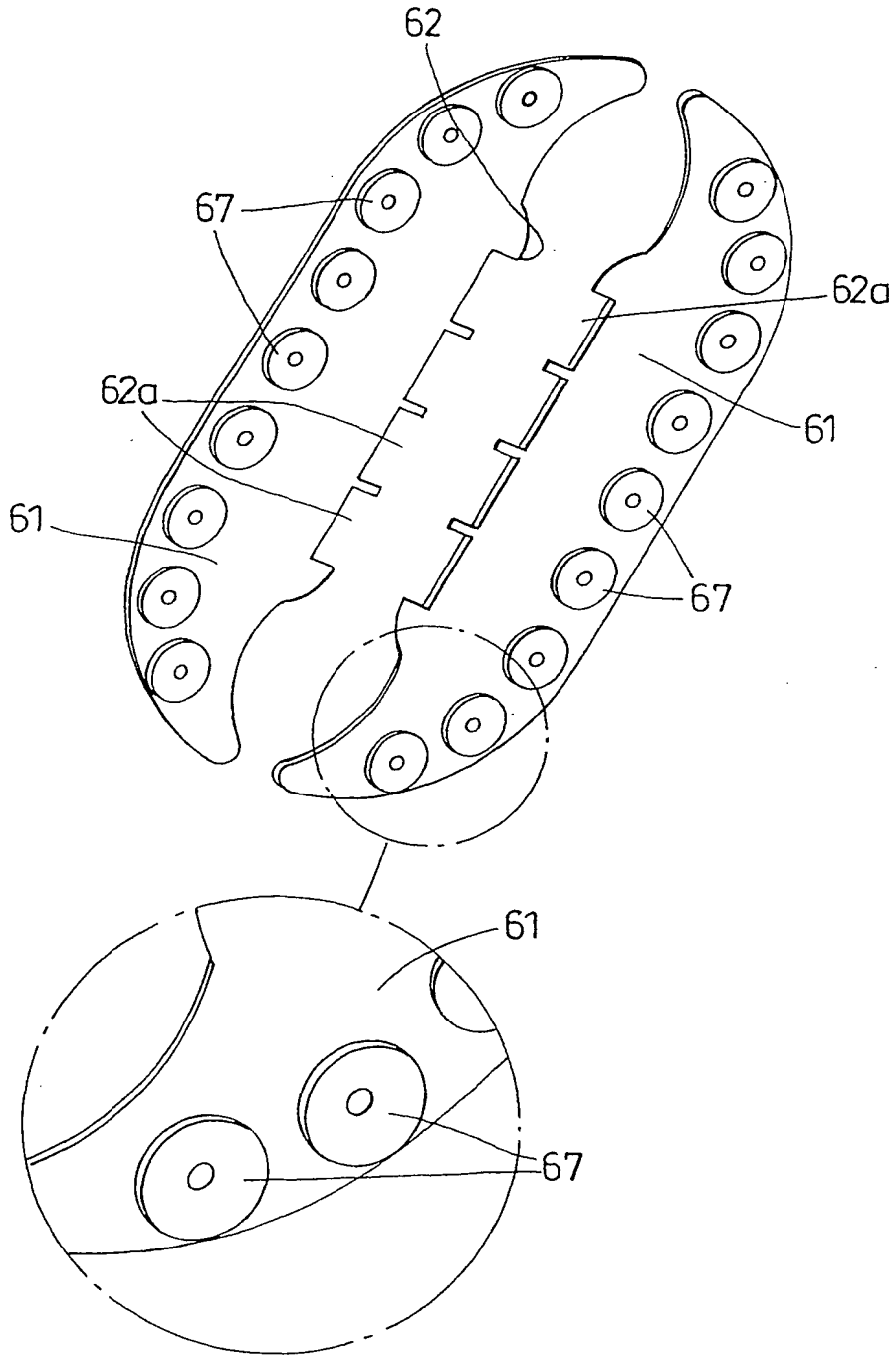


*Fig. 7*

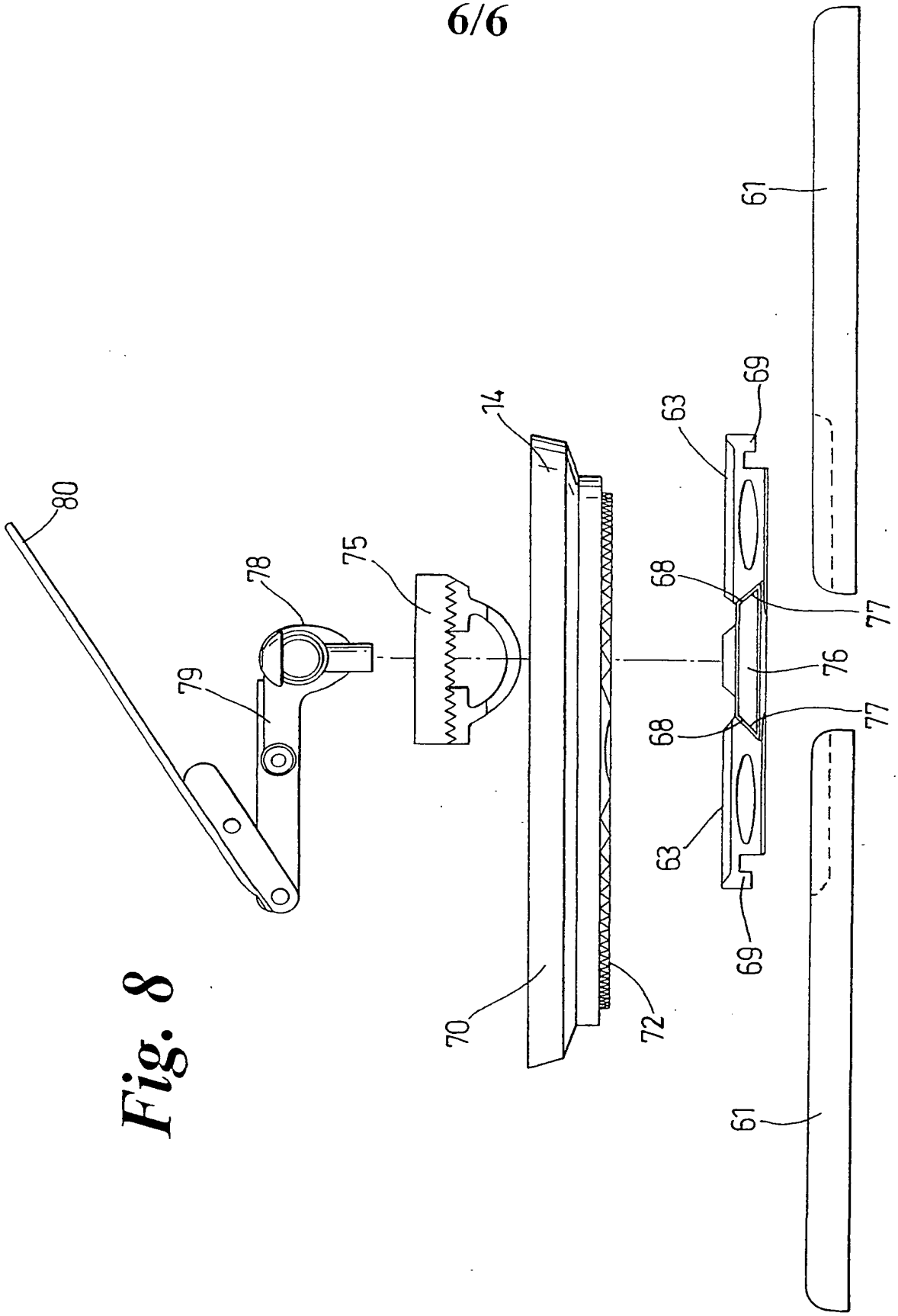


*Fig. 8*

# INTERNATIONAL SEARCH REPORT

International Application No
PCT/GB 02/00905

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 A63C9/08

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 A63C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category ° | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|---|---|---|
| A | FR 2 618 688 A (SCOTT DE MARTINVILLE EDOUARD) 3 February 1989 (1989-02-03) the whole document | 1 |
| A | US 6 189 899 B1 (CARLSON STEPHEN R) 20 February 2001 (2001-02-20) the whole document | 1 |
| A | FR 2 736 842 A (SALOMON SA) 24 January 1997 (1997-01-24) the whole document | 1-3 |
| A | FR 2 755 025 A (FIN S INTERNATIONAL) 30 April 1998 (1998-04-30) the whole document | 1 |

☐ Further documents are listed in the continuation of box C.

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| Date of the actual completion of the international search | Date of mailing of the international search report |
|---|---|
| 21 June 2002 | 27/06/2002 |

| Name and mailing address of the ISA | Authorized officer |
|---|---|
| European Patent Office, P.B. 5818 Patentlaan 2<br>NL – 2280 HV Rijswijk<br>Tel. (+31–70) 340–2040, Tx. 31 651 epo nl,<br>Fax: (+31–70) 340–3016 | Verelst, P |

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information on patent family members

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